REMARKS

Claims 1-22 are pending in this application. By this amendment, Applicants amend claims 1, 5, 9, 14, 19 and 21.

Applicants greatly appreciate the Examiner's indication that claims 4, 6, 7, 13, 15-17 and 20 would be allowable if rewritten in independent form including all of the features of the base claim and any intervening claims.

The drawings were objected to because Fig. 15 was not designated as --PRIOR ART--. Applicants have amended Fig. 15 to be properly designated as --PRIOR ART-- in the accompanying Request for Approval of Drawing Corrections. Accordingly, Applicants respectfully request reconsideration and withdrawal of this objection.

The drawings were further objected to for failing to show every feature recited in the claims. Applicants have amended claim 21 to be consistent with the specification and the drawings. Accordingly, Applicants respectfully request reconsideration and withdrawal of this objection.

Claims 5 and 14 were objected to for containing informalities. Applicants have amended claims 5 and 14 to correct the informalities noted by the Examiner. Accordingly, Applicants respectfully request reconsideration and withdrawal of this objection.

Claims 19 and 21 were rejected under 35 U.S.C. § 112, second paragraph, for allegedly being indefinite. Applicants have amended claims 19 and 21 to correct the informalities noted by the Examiner. Accordingly, Applicants respectfully request reconsideration and withdrawal of this rejection.

Claims 1-3 and 8 were rejected under 35 U.S.C. 102(e) as being anticipated by Hartmann et al. (U.S. 6,268,782). In addition, claims 9, 11, 12, 14, 18, 21 and 22 were rejected under 35 U.S.C. § 102(b) as being anticipated by Saw et al. (U.S. 5,835,990). And finally, claims 1-3, 5, 8 and 10 were rejected under 35 U.S.C. 103(a) as being unpatentable over Saw et al. in view of Hartmann et al. Applicants respectfully traverse

these rejections.

Claim 1 has been amended to recite:

> "A longitudinally coupled resonator type surface acoustic wave filter having a balance-unbalance conversion function, the filter comprising:
> a piezoelectric substrate; and
> first, second and third IDTs arranged on the piezoelectric substrate in a surface acoustic wave propagating direction, the second IDT being located between the first and third IDTs and having an even number of electrode fingers; wherein
> **said second IDT includes two opposed bus bars and said electrode fingers of said second IDT extend from each of said two opposed bus bars toward each other and are interdigitated with each other, said electrode fingers of said second IDT are interdigitated such that no two of the electrode fingers extending from one of said two opposed bus bars are immediately adjacent to each other.**"
> (Emphasis added)

The Examiner alleged that Hartmann et al. teaches all of the features recited in Applicants' claim 1 including the second IDT being located between the first and third IDTs and having an even number of electrode fingers. However, as clearly seen in Fig. 7(a) of Hartmann et al., and as acknowledged by the Examiner, the second IDT 706 includes split electrodes, "and hence, has an even number of electrode fingers." The split electrodes in the second IDT 706 of Hartmann et al. are adjacent to each other and extend from the same side surface of the IDT 706.

Thus, Hartmann et al. clearly fails to teach or suggest "said second IDT includes two opposed bus bars and said electrode fingers of said second IDT extend from each of said two opposed bus bars toward each other and are interdigitated with each other, said electrode fingers of said second IDT are interdigitated such that **no two of the electrode fingers extending from one of said two opposed bus bars are immediately adjacent to each other**" (emphasis added) as recited in the present claimed invention.

In addition, the Examiner acknowledged that Saw et al. fails to teach or suggest a "center electrode in at least one stage of the filter having an even number of electrode

fingers." However, the Examiner alleged that Hartmann et al. teaches "as explained above that it is well known in the art when splitting an interdigital transducer, that the two halves each have an odd number of fingers 2N+1 or 4N+2, which must be an even number." Thus, the Examiner concluded that it would have been obvious to have modified the two stage filter of Saw et al. such that the split central IDT 36 of the second-stage filter would have had an even number of electrode fingers as taught by Hartmann et al.

As indicated above, Hartmann et al. clearly fails to teach or suggest "said second IDT includes two opposed bus bars and said electrode fingers of said second IDT extend from each of said two opposed bus bars toward each other and are interdigitated with each other, said electrode fingers of said second IDT are interdigitated such that **no two of the electrode fingers extending from one of said two opposed bus bars are immediately adjacent to each other**" (emphasis added) as recited in the present claimed invention. Thus, Applicants respectfully submit that Hartmann et al. fails to cure the deficiencies of Saw et al.

Accordingly, Applicants respectfully submit that Hartmann et al. and Saw et al., applied alone or in combination, fail to teach or suggest the unique combination and arrangement of elements recited in claim 1 of the present application.

Claim 9 has been amended to recite:

> "A longitudinally coupled resonator type surface acoustic wave filter having a balance-unbalance conversion function, the filter comprising:
>
> first-stage and second-stage longitudinally coupled resonator type surface acoustic wave filters longitudinally coupled to each other, each of the first-stage longitudinally coupled resonator type surface acoustic wave and the second-stage longitudinally coupled resonator type surface acoustic wave filter including a piezoelectric substrate and first, second and third IDTs arranged on the piezoelectric substrate in a surface acoustic wave propagating direction, **said second-stage longitudinally coupled resonator type surface acoustic wave filter including two opposed bus bars and electrode fingers extending in a longitudinally direction of the electrode fingers from each of said two opposed bus bars and being interdigitat d with each other**;

an unbalanced signal terminal connected to one end of the second IDT of the first-stage longitudinally coupled resonator type surface acoustic wave filter;

a first balanced signal terminal connected to one of said two opposed bus bars of the second IDT of the second-stage longitudinally coupled resonator type surface acoustic wave filter;

a second balanced signal terminal connected to the other of said two opposed bus bars of the second IDT of the second-stage longitudinally coupled resonator type surface acoustic wave filter;

a first signal line connecting one end of the first IDT of the first-stage longitudinally coupled resonator type surface acoustic wave filter and one end of the first IDT of the second-stage longitudinally coupled resonator type surface acoustic wave filter; and

a second signal line connecting one end of the third IDT of the first-stage longitudinally coupled resonator type surface acoustic wave filter and one end of the third IDT of the second-stage longitudinally coupled resonator type surface acoustic wave filter;

wherein an electric signal propagating through the first signal line is 180° out of phase with an electric signal propagating through the second signal line." (Emphasis added)

The Examiner alleged that Saw et al. (Fig. 17) teaches all of the features recited in Applicants' claim 9, including "a first balanced signal terminal connected to one end (i.e. the left end in the figure)" and "a second balanced signal terminal connected to the other end (i.e. the right end in the figure)".

As clearly seen in Fig. 17 of Saw et al. and as acknowledged by the Examiner, the first and second balanced signal terminals are connected to left and right ends of the second IDT 36 **on the same bus bar** of the second IDT 36. Thus, Saw et al. clearly fails to teach or suggest "a first balanced signal terminal connected to one of said two opposed bus bars of the second IDT of the second-stage longitudinally coupled resonator type surface acoustic wave filter" and "a second balanced signal terminal connected to the other of said two opposed bus bars of the second IDT of the second-stage longitudinally coupled resonator type surface acoustic wave filter" where the two opposed bus bars are defined such that electrode fingers extend "in a longitudinally direction of the electrode fingers from each of said two opposed bus bars and being

interdigitated with each other" as recited in claim 9 of the present application.

Accordingly, Applicants respectfully submit that Saw et al. fails to teach or suggest the unique combination and arrangement of elements and method steps recited in claim 9 of the present application.

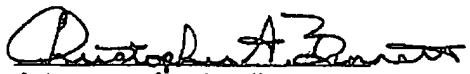
In view of the foregoing Amendments and Remarks, Applicants respectfully submit that Claims 1 and 9 are allowable over the prior art for the reasons described above. Claims 2-8 and 10-22 depend upon claims 1 and 9, and are therefore allowable for at least the reasons that claims 1 and 9 are allowable.

In view of the foregoing Remarks, Applicants respectfully submit that this application is in condition for allowance. Favorable consideration and prompt allowance are respectfully solicited.

To the extent necessary, Applicants petition the Commissioner for a One-month extension of time, extending to February 18, 2003, the period for response to the Office Action dated October 18, 2002.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. **50-1353**.

Respectfully submitted,



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VERSION WITH MARKINGS SHOWING CHANGES MADE

1. (Amended) A longitudinally coupled resonator type surface acoustic wave filter having a balance-unbalance conversion function, the filter comprising:

a piezoelectric substrate; and

first, second and third IDTs arranged on the piezoelectric substrate in a surface acoustic wave propagating direction, the second IDT being located between the first and third [IDTS] IDTs and having an even number of electrode fingers; wherein

said second IDT includes two opposed bus bars and said electrode fingers of said second IDT extend from each of said two opposed bus bars toward each other and are interdigitated with each other, said electrode fingers of said second IDT are interdigitated such that no two of the electrode fingers extending from one of said two opposed bus bars are immediately adjacent to each other.

5. (Amended) A longitudinally coupled resonator type surface acoustic wave filter according to claim 1, wherein [the] electrode fingers of said first and third IDTs adjacent to the second IDT have opposite polarities.

9. (Amended) A longitudinally coupled resonator type surface acoustic wave filter having a balance-unbalance conversion function, the filter comprising:

first-stage and second-stage longitudinally coupled resonator type surface acoustic wave filters longitudinally coupled to each other, each of the first-stage longitudinally coupled resonator type surface acoustic wave and the second-stage longitudinally coupled resonator type surface acoustic wave filter including a piezoelectric substrate and first, second and third IDTs arranged on the piezoelectric substrate in a surface acoustic wave propagating direction, said second-stage longitudinally coupled resonator type surface acoustic wave filter including two opposed bus bars and electrode fingers extending in a longitudinally direction of the electrode

fingers from each of said two opposed bus bars and being interdigitated with each other;

an unbalanced signal terminal connected to one end of the second IDT of the first-stage longitudinally coupled resonator type surface acoustic wave filter;

a first balanced signal terminal connected to one of said two opposed bus bars [end] of the second IDT of the second-stage longitudinally coupled resonator type surface acoustic wave filter;

a second balanced signal terminal connected to the other of said two opposed bus bars [end] of the second IDT of the second-stage longitudinally coupled resonator type surface acoustic wave filter;

a first signal line connecting one end of the first IDT of the first-stage longitudinally coupled resonator type surface acoustic wave filter and one end of the first IDT of the second-stage longitudinally coupled resonator type surface acoustic wave filter; and

a second signal line connecting one end of the third IDT of the first-stage longitudinally coupled resonator type surface acoustic wave filter and one end of the third IDT of the second-stage longitudinally coupled resonator type surface acoustic wave filter;

wherein an electric signal propagating through the first signal line is 180° out of phase with an electric signal propagating through the second signal line.

14. (Amended) A longitudinally coupled resonator type surface acoustic wave filter according to claim 9, wherein in each of the first-stage and second-stage longitudinally coupled resonator type surface acoustic wave filters, [the] electrode fingers of said first and third IDTs adjacent to the second IDT have opposite polarities.

19. (Amended) A longitudinally coupled resonator type surface acoustic wave filter according to claim 9, wherein in each of the first-stage and second-stage

longitudinally coupled resonator type surface acoustic wave filters, the [polarity] polarities of the electrode fingers of the second IDT adjacent to the first and third IDTs are [is] the same as the polarities of [the] electrode fingers of the first and third IDTs adjacent to the second IDT.

21. (Amended) A longitudinally coupled resonator type surface acoustic wave filter according to claim 9, wherein in [each of the first-stage and] said second-stage longitudinally coupled resonator type surface acoustic wave filter, the second IDT is split into two parts.